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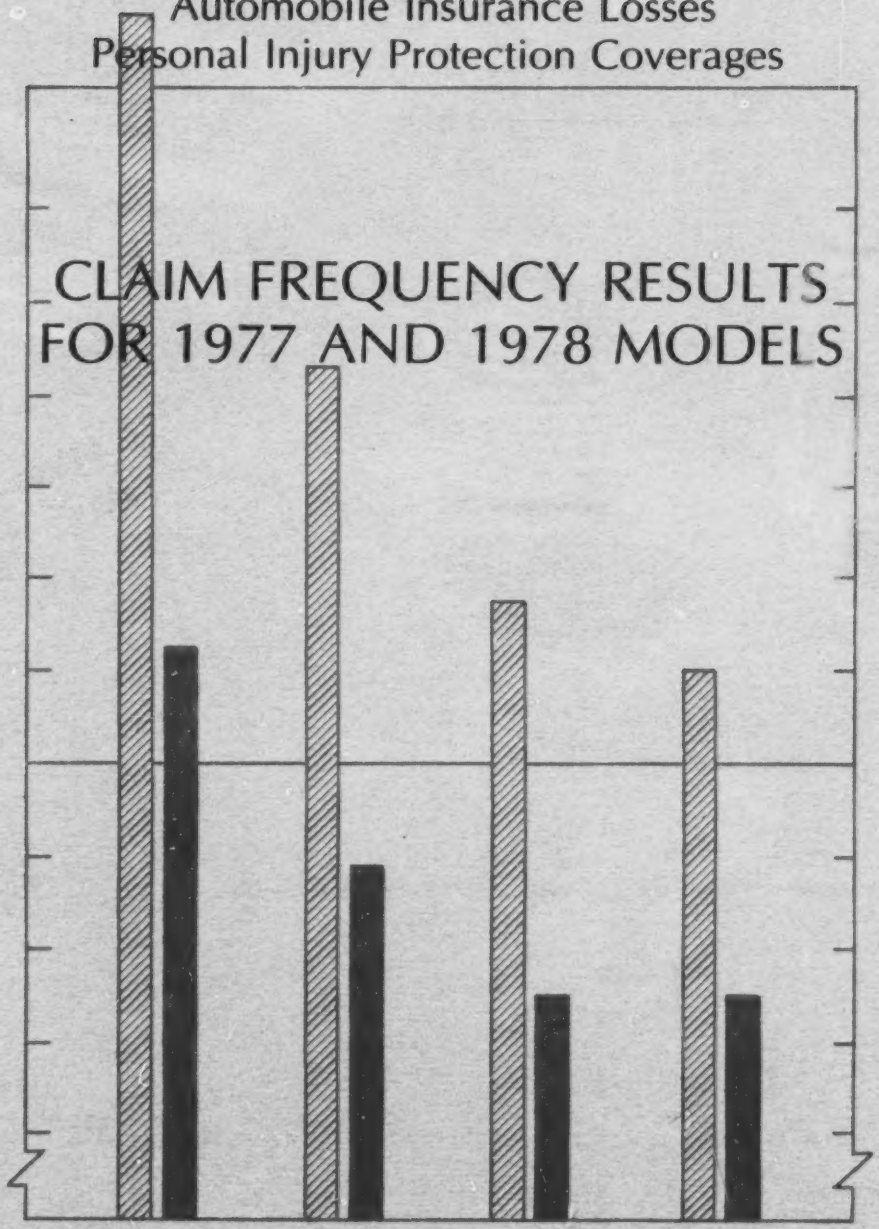
Research Report HLDI I 78-1
September 1979

Automobile Insurance Losses
Personal Injury Protection Coverages

CLAIM FREQUENCY RESULTS FOR 1977 AND 1978 MODELS



Highway
Loss
Data
Institute

Watergate 600, Washington, D.C.

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Personal Injury Protection Coverages

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Highway Loss Data Institute
Watergate Six Hundred
Washington, D.C. 20037

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Summary

This Highway Loss Data Institute report presents the frequencies of injury insurance claims to occupants of 1977 and 1978 model year passenger cars by car size group, body style subgroup, and individual series. The results are derived from the "no-fault" personal injury protection injury experience of cars of the two model years from their introduction through December 1978.

1978 model year results are presented for the 41 individual vehicle series from 13 makes (Buick, Cadillac, Chevrolet, Chrysler, Datsun, Ford, Honda, Mercury, Oldsmobile, Plymouth, Pontiac, Toyota, Volkswagen) which had more than 5,000 insured vehicle years of exposure; 31 of these series had more than one percent of the total exposure for the model year. 1977 model year results are presented for 89 individual vehicle series from 16 makes (the same as above plus American Motors, Dodge, and Lincoln); 30 of these series had more than one percent of the total exposure for the model year. No inferences can be drawn concerning the injury claim frequency experience of cars not summarized in this report.

The principal results fall in two categories: new findings concerning individual makes and series; and reconfirmation of previous findings relating injury losses, car sizes, and body styles.

New Findings

- Table 2 on page 7 summarizes the experience of the five high-volume (those with at least one percent of the total exposure) 1978 models with the best and the five high-volume models with the worst injury claim frequencies. The Honda Civic two-door had the worst claim frequency and the Oldsmobile Delta 88 four-door the best.

- All five of the 1978 models with the worst results were subcompacts. Four of these were imports made by Datsun, Honda, and Toyota and the other was a domestic Ford product.

- All five of the 1978 models with the best results were General Motors (GM) products; four were intermediates, one was a compact, and all were four-door models.

- Three of the five 1978 models with the worst claim frequency results, the Honda Civic, Toyota Corolla, and Datsun B-210, were also among the 1977 models with the worst results.

- Four of the five 1978 models with the best claim frequency results, the Oldsmobile Delta 88, Chevrolet Caprice, Buick LeSabre, and Chevrolet Impala, were also among the 1977 models with the best results.

- Table 5 on page 17 summarizes the 1977 models with the best and the worst claim frequencies. Results are presented for both high-volume models (those with at least one percent of the total exposure) and also for low-volume models (those with less than one percent of the exposure). Among the high-volume models, the Datsun B210 had the worst claim frequency results and the Oldsmobile Delta 88 four-door the best. Among the low-volume 1977 models, the Datsun 200 SX two-door had the worst claim frequency results and the Chrysler Newport four-door the best.

- Among the ten 1977 models with the worst injury claim frequencies, eight were subcompacts and two were compacts. Six of the ten were imports made by Datsun, Honda, Mitsubishi (Plymouth Arrow), and Toyota and the other four were domestic GM products.

- Among the eleven 1977 models with the best injury claim frequencies, eight were intermediates, two were full-size, and one was a compact. All eleven were domestic models from two manufacturers, Chrysler and GM.

Repeat Findings

- Cars with smaller wheelbases had much higher injury claim frequencies than cars with larger wheelbases (see Tables 1 and 4 on pages 5 and 14).

- In each car size group, youthful operators had far higher injury claim frequencies than no youthful operators. The claim frequencies for both age groups increased greatly with decreasing wheelbase (see Figures 1 and 3 on pages 6 and 15).

- Regular two-door models consistently had higher injury claim frequencies than corresponding four-door models (see Figures 2 and 4 on pages 8 and 16).

- Within the subcompact, compact, and intermediate size groups, sports or specialty models consistently had the highest claim frequencies (see Figures 2 and 4 on pages 8 and 16).

It is intended that the dissemination of this and other HLDI reports will contribute to research into ways for reducing crash damage to people and property, and also provide the public with information relating to the differences in the crash damage produced by different kinds of vehicles.

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Introduction

The Highway Loss Data Institute (HLDI) is a non-profit, public service organization that gathers, processes, and publishes insurance data concerned with human and economic losses associated with motor vehicle use, and, especially, with the ways such losses vary among different kinds of vehicles.

This report compares the frequencies of insurance claims for injuries to occupants of 1977 and 1978 model year passenger cars by car size group, body style subgroup, and individual series.

The injury claim frequencies reported are based on counts of crashes involving at least one medical claim under personal injury protection insurance coverages. A detailed description of these first-party coverages, which principally insure against medical losses to occupants of the insured cars themselves, is given in Appendix B. The data used were supplied by four insurers: Aetna Life and Casualty, Allstate, Nationwide, and State Farm. A description of the sources and nature of data is presented in Appendix C.

This report is based on injury coverages and claims for 1977 model year vehicles in the calendar period September 1976 through December 1978 and for 1978 model year vehicles in the period September 1977 through December 1978. Vehicle series designations by make and size class for series whose results are included in this report are given in HLDI reports R78-1 and I77-1.

Analysis

Personal Injury Protection Coverages

Results in this report are based on "personal injury protection" (PIP) coverages which are provided in so-called no-fault states. These coverages were selected because they provide medical expense reimbursement to injured occupants of the insured car.

Use of PIP insurance data to identify crashes involving injury has certain limitations because these data cannot provide information on all occupant injuries. This occurs when claims for injury costs are not made under PIP coverages because of the availability of other sources of medical expense reimbursements, such as bodily injury liability and/or health insurance coverages. Consequently, PIP claim frequencies do not include all of the crashes involving injury. This limitation should not distort comparisons among different vehicles.

Vehicle Description and Identification

The Vehicle Identification Numbers (VINs) of most new automobiles sold in the United States are individually unique numbers that contain, in coded form, detailed information as to each vehicle's make, model year, series,* and other distinguishing characteristics.

The very specific vehicle types for which results are presented in this report were derived from the VINs of the individual automobiles.

Only data with valid VINs were used for this report. Each VIN was decoded into a set of specific characteristics. For the purposes of this report the vehicle characteristics of primary concern were make, model year, series, body style, and wheelbase.

Exposure

Exposure, in terms of insured vehicle years, was computed for each individual vehicle from the coverage data. The total number of insured vehicle years for each vehicle series was then obtained by accumulating the exposure for all of the individual vehicles of that vehicle series.

For each vehicle series, the exposure was also computed for each operator age group – youthful operators and no youthful operators.*

Claim Frequency

Both pending and paid claims for an individual vehicle were first matched with its corresponding coverage data to ensure that the crash had occurred within an appropriate period of coverage for that vehicle. In every instance in which multiple claims were made for the same crash – e.g., when more than one occupant of the car incurred medical expenses – the claims were treated as a single injury claim in the calculation of claim frequency. It should be noted that some medical expenses can sometimes be incurred even though the occupants are not injured. This can occur for example when precautionary medical examinations are undertaken even though no injuries are apparent, or, in fact, found.

*See Appendix D for definitions.

All injury claims involving medical expense reimbursements were used, together with the corresponding exposure, to compute the claim frequency in terms of the number of claims per 1,000 insured vehicle years. Claims involving non-medical losses only and claims settled without payments were not used. Thus, the claim frequencies represent the number of crashes per 1,000 insured vehicle years in which one or more injuries occurred resulting in medical expense claim payments under PIP insurance coverages.

Standardization

The losses for different vehicles can vary substantially in relation to certain non-vehicle factors. One important factor with which claim frequency varies is the operator age group; and the mix of operator ages can vary considerably among different vehicle types – so considerably that it could distort comparisons of results between vehicles if not taken into account.

Youthful operators have higher insurance claim frequencies than older drivers. Thus, if two vehicle types have different proportions of youthful operators, this difference, if not taken into consideration, would be sufficient to bias comparisons. To remove this effect for each vehicle type, the results for each vehicle type were weighted, using the values shown below, to produce a weighted average of the actual results for each operator age group. In this way the results for each vehicle type are based on the same mix, or distribution, of exposure for the two operator age groups.

Since the same weights are used for each vehicle type, the effects due to operator age group are present in equal amounts in the standardized results for each vehicle type. Therefore, to the extent that the age distributions within operator age group do not vary substantially for different vehicles, these effects can no longer bias comparisons among vehicles.

This standardization procedure is widely used in vital health statistics.* The basic principle of this standardization procedure is the introduction of a standard distribution of exposure for the different operator age groups.

OPERATOR AGE GROUP WEIGHTS

Youthful Operator	No Youthful Operator	Combined
0.15	0.85	1.0

Exposure Threshold for Reporting Results

A threshold of 5,000 insured vehicle years of exposure was selected for the reporting of results for vehicle size classes, subgroups, and individual vehicle series. Consequently, no results are presented in this report for any of the vehicle series with smaller amounts of experience. In addition, it should be kept in mind that, in general, the greater the exposure associated with a reported claim frequency, the more confidence can be placed in it.

*For example, see Armitage, P., *Statistical Methods in Medical Research*, Wiley, New York, 1971.

Results and Discussion

1978 Models

Table 1 summarizes the injury claim frequency results for 1978 model year passenger cars by car size group -- subcompact, compact, intermediate, and full-size. These results are based on 655,491 insured vehicle years of exposure.

Comparison of Results for Car Size Groups

The results in Table 1 indicate that cars with smaller wheelbases had higher injury claim frequencies than cars with larger wheelbases. Previous HLDI and other studies have repeatedly documented a pattern of higher injury rates for small cars compared with large cars.

TABLE 1

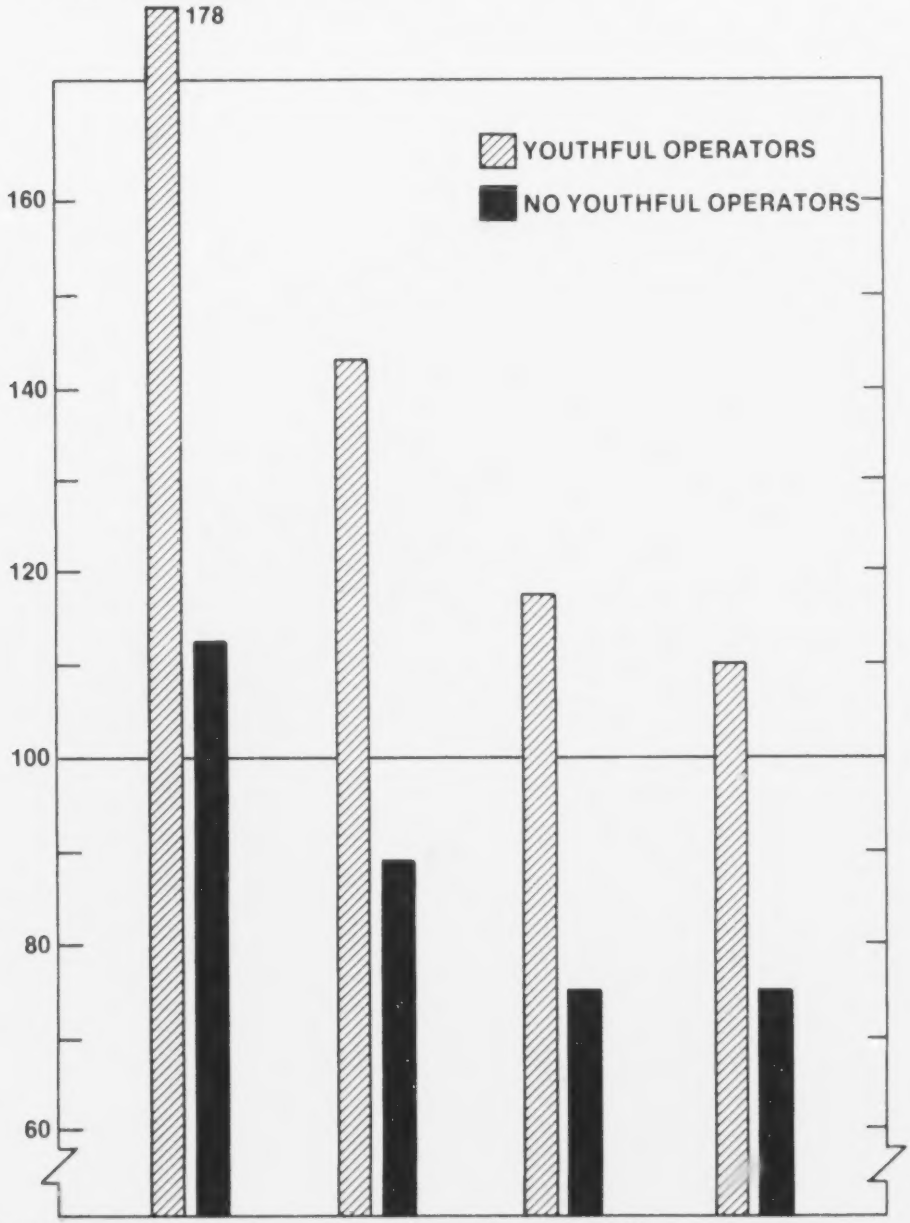
INJURY CLAIM FREQUENCIES FOR CARS OF DIFFERENT SIZES[1] – PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

CAR SIZE	CLAIM FREQUENCY PER 1,000 INSURED VEHICLE YEARS
All Combined	20.8
Subcompact[2]	25.4
Compact[3]	20.3
Intermediate[4]	16.9
Full-Size[5]	16.7

[1] Results are standardized to the exposure distribution:
15% Youthful Operator
85% No Youthful Operator
[2] Wheelbase less than or equal to 101 inches.
[3] Wheelbase greater than 101 and less than or equal to 111 inches.
[4] Wheelbase greater than 111 and less than or equal to 120 inches.
[5] Wheelbase greater than 120 inches.

Figure 1 shows the claim frequency results for youthful and no youthful operators within each of the four car size groups, relative to the all-vehicles-combined result of 20.8 claims per 1,000 insured vehicle years. In each size group, youthful operators had far higher injury claim frequencies than no youthful operators. For example, in the subcompact size group the relative claim frequencies were 178 (or 78 percent above average) with youthful operators and 112 with no youthful operators. Among the size groups, the claim frequencies for *both* operator age groups generally increased dramatically with decreasing wheelbase. Similar results have been repeatedly found in the past.

Figure 1
Relative injury claim frequencies by operator age group personal injury protection coverages 1978 models



Unlike previous model years, small cars dominated the 1978 model year exposure, subcompact and compact models together accounting for 66 percent of the total exposure for 1978 models compared with 40 percent for the corresponding 1977 models.

Comparison of Results for Body Style Subgroups

Figure 2 shows the relative injury claim frequency results for the regular two-door, regular four-door, and sports or specialty models within each of the car size groups. The results for station wagons, which were generally based on substantially less exposure than the other body style subgroups, are not shown in the figure, but are included in the detailed results presented in Table 3.

Among subcompacts, compacts, and intermediates, the injury claim frequencies for *each* of the three body style subgroups varied inversely with wheelbase. For example, the relative injury claim frequencies were 126 for regular two-door subcompacts, 97 for regular two-door compacts, and 88 for regular two-door intermediates.

Within each of the four car size groups, the injury claim frequencies were higher for regular two-door models than the corresponding four-door models. Within the subcompact, compact, and intermediate size groups, injury claim frequencies were highest for sports or specialty models.

Similar body style variations have been repeatedly documented in past HLDI reports.

Variations Among Individual Series

Table 2 summarizes the individual series with the best and the worst injury loss experience among the high-volume 1978 model year cars (those with at least one percent of the total exposure for the model year). These rankings, in each case compared with an average of 100 – the overall experience of all cars combined, are based on the relative injury claim frequencies shown in Table 3.

TABLE 2

RELATIVE INJURY CLAIM FREQUENCIES PER 1,000 INSURED VEHICLE YEARS
FOR THE 1978 MODEL YEAR CARS WITH THE BEST AND WORST LOSS EXPERIENCE[1]
PERSONAL INJURY PROTECTION COVERAGES

	BEST CARS				WORST CARS			
HIGH VOLUME (At least 1% of total exposure)	Oldsmobile Delta 88	4-Door	I	55	Honda Civic	2-Door	SC	144
	Chevrolet Caprice	4-Door	I	64	Toyota Corolla	––[2]	SC	142
	Buick LeSabre	4-Door	I	65	Datsun B-210	––[2]	SC	140
	Chevrolet Impala	4-Door	I	75	Ford Mustang II	2-Door	SC	133
	Chevrolet Nova	4-Door	C	79	Toyota Celica	2-Door	SC	131

[1] Results are standardized to the exposure distribution:

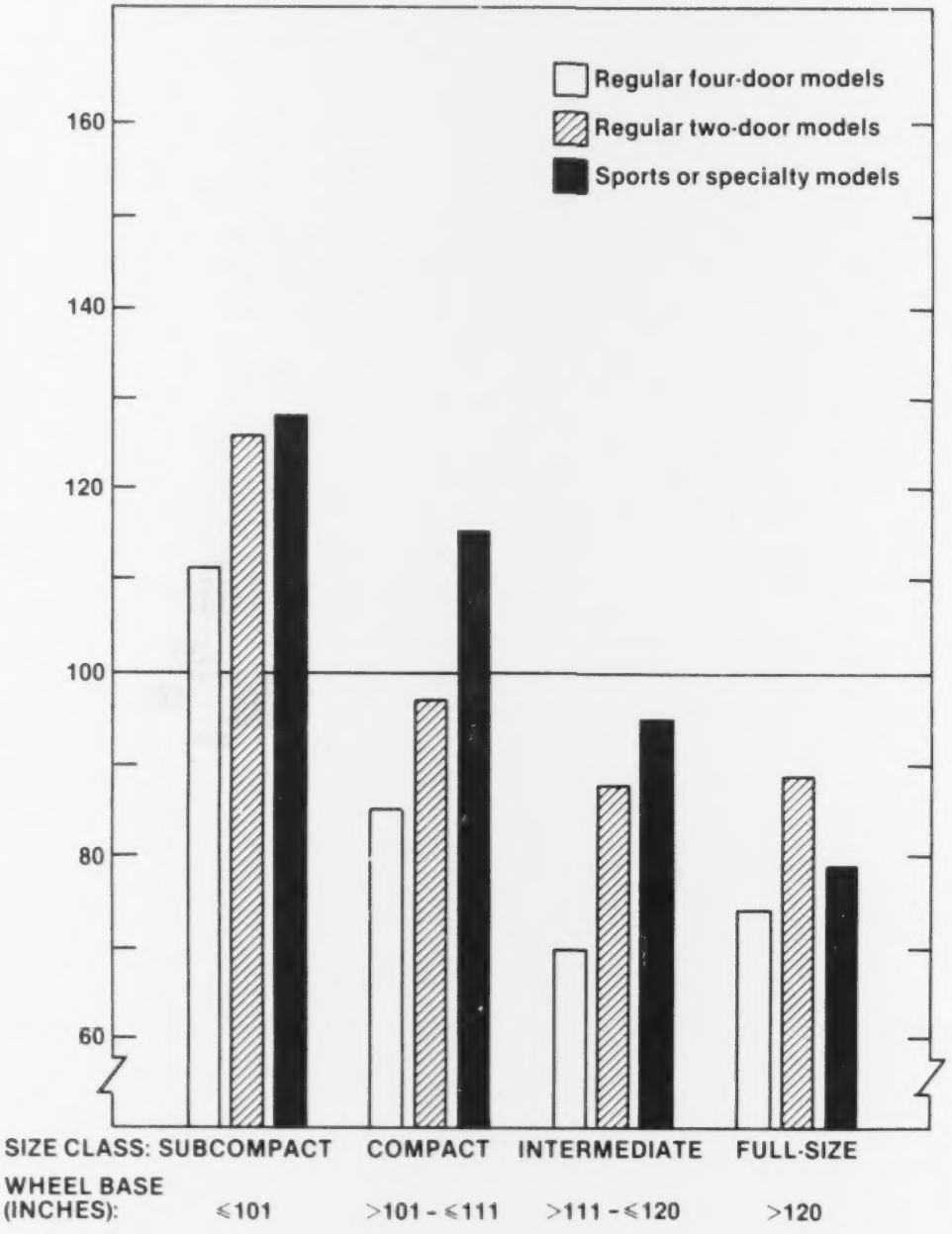
YOUTHFUL OPERATOR	NO YOUTHFUL OPERATOR
15%	85%

100 = 20.8 claims per 1000 insured vehicle years
= claim frequency for all 1978 model year cars.

[2] Body style not determinable from Vehicle Identification Number.

Subcompact (SC) – cars with wheelbases less than or equal to 101 inches.
Compact (C) – cars with wheelbases greater than 101 inches and less than or equal to 111 inches.
Intermediate (I) – cars with wheelbases greater than 111 inches and less than or equal to 120 inches.
Full-Size (FS) – cars with wheelbases greater than 120 inches.

Figure 2
Relative injury claim frequencies by body style personal injury protection coverages 1978 models



Cars with the highest relative injury claim frequencies were the Honda Civic (144), Toyota Corolla (142), and Datsun B-210 (140), and cars with the lowest claim frequencies were the four-door Oldsmobile Delta 88 (55), four-door Chevrolet Caprice (64), and four-door Buick LeSabre (65).

All five of the cars with the worst injury claim frequency experience were subcompacts. Four of the five worst cars were imports made by Datsun, Honda, and Toyota.

All five cars with the best injury loss experience were four-door models, four intermediates and one compact. All five of the cars with the best injury claim frequency experience were General Motors (GM) products: three Chevrolets, one Buick, and one Oldsmobile.

Table 3 presents the relative injury claim frequency results for the 1978 models by car size group, body style subgroup – regular two-door, regular four-door, station wagon, and sports or specialty models – and individual series. Detailed results corresponding to those in Table 3, including the claim frequency results for youthful and no youthful operators and the confidence intervals for claim frequencies are given in Appendix A, and computational details in Appendix E.

The individual series results in Table 3 are listed within each body style subgroup in ascending sequence of the relative claim frequencies. The 41 individual series listed had exposures exceeding the threshold for reporting results.

It is also noted that, with the 1978 model year, General Motors redesigned and reduced the wheelbases of the Chevrolet Malibu, Buick Century, Oldsmobile Cutlass, and Pontiac LeMans from the intermediate to the compact size category. In addition, some series, such as the Ford Maverick and Mercury Comet, were discontinued, and new series, such as the AMC Concord, Dodge Omni, Ford Fairmont, Mercury Zephyr, and Plymouth Horizon, were introduced. Therefore caution is necessary where comparing results for the 1977 and 1978 model years.

TABLE 3

RELATIVE INJURY CLAIM FREQUENCY RESULTS BY MAKE AND SERIES*
PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

PART A: ALL CARS

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
All	All	655,491	100 = 20.8

See page 13 for footnotes.

TABLE 3

RELATIVE INJURY CLAIM FREQUENCY RESULTS BY MAKE AND SERIES*
PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

PART B: SUBCOMPACT CARS (wheelbase ≤ 101 in.)

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
All	**Subcompact**	**192,210**	**122**
Regular Two-Door Models		**138,311**	**126**
Chevrolet	Chevette	10,946	104
Volkswagen	Rabbit†	14,909	105
Pontiac	Sunbird	5,810	107
Honda	Accord	5,741	108
Chevrolet	Monza	7,917	109
Ford	Pinto	9,645	126
Toyota	Celica	7,263	131
Ford	Mustang II	16,496	133
Datsun	B-210†	7,906	140
Toyota	Corolla†	12,421	142
Honda	Civic	6,805	144
Regular Four-Door Models		**26,948**	**111**
Chevrolet	Chevette	12,395	108
Plymouth	Horizon	6,499	115
Station Wagons		**19,162**	**101**
Sports		**7,789**	**128**

See page 13 for footnotes.

TABLE 3

RELATIVE INJURY CLAIM FREQUENCY RESULTS BY MAKE AND SERIES*
PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

PART C: COMPACT CARS (101 in. < wheelbase ≤ 111 in.)

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
All	**Compact**	**245,128**	**98**
Regular Two-Door Models		**104,413**	**97**
Oldsmobile	Cutlass	27,494	88
Chevrolet	Malibu	7,954	92
Buick	Century/Regal	15,355	94
Chevrolet	Nova	9,370	98
Ford	Granada	7,118	110
Ford	Fairmont	11,310	122
Regular Four-Door Models		**50,259**	**85**
Chevrolet	Nova	8,003	79
Chevrolet	Malibu	7,298	81
Ford	Granada	6,553	85
Ford	Fairmont	6,781	94
Station Wagons		**24,923**	**82**
Chevrolet	Malibu	6,001	77
Ford	Fairmont	8,153	92
Specialty		**65,533**	**115**
Pontiac	Grand Prix	14,667	111
Chevrolet	Monte Carlo	20,363	116
Chevrolet	Camaro	17,774	120
Pontiac	Firebird	11,582	121

See page 13 for footnotes.

TABLE 3

RELATIVE INJURY CLAIM FREQUENCY RESULTS BY MAKE AND SERIES*
PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

PART D: INTERMEDIATE CARS (111 in. < wheelbase ≤ 120 in.)

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
All	**Intermediate**	**168,328**	**81**
Regular Two-Door Models		**35,605**	**88**
Oldsmobile	Delta 88	5,610	76
Ford	LTD II	5,393	113
Regular Four-Door Models		**66,941**	**70**
Oldsmobile	Delta 88	9,164	55
Chevrolet	Caprice	10,814	64
Buick	LeSabre	6,619	65
Pontiac	Bonneville	5,545	69
Chevrolet	Impala	8,452	75
Station Wagons		**22,729**	**73**
Specialty		**43,054**	**95**
Chrysler	Cordoba	6,242	82
Ford	Thunderbird	21,569	99
Mercury	Cougar XR-7	9,971	99

See page 13 for footnotes.

TABLE 3

RELATIVE INJURY CLAIM FREQUENCY RESULTS BY MAKE AND SERIES*
PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

PART E: FULL-SIZE CARS (wheelbase > 120 in.)

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
All	Full-Size	49,825	80
Regular Two-Door Models		7,742	89
Regular Four-Door Models		13,485	74
Ford	LTD	6,351	74
Station Wagons		**	**
Specialty		24,768	79
Cadillac	DeVille 2D	7,742	82

Footnotes for Table 3:

*Results are standardized to the exposure distribution:

Youthful Operator	No Youthful Operator
15%	85%

Series are ranked within group and subgroup by ascending claim frequency per 1,000 insured vehicle years. Series with less than 5,000 insured vehicle years of exposure are not summarized.

†Body style is not determinable from Vehicle Identification Number.

**This subgroup has less than 5,000 insured vehicle years of exposure.

1977 Models

Table 4 summarizes the injury claim frequency results for 1977 model year passenger cars by car size group. These results are based on 1,684,565 insured vehicle years of exposure.

Comparison of Results for Car Size Groups

The inverse relationship between injury claim frequency and car size indicated in Table 1 for the 1978 models is also indicated in Table 4 – cars with smaller wheelbases had higher injury claim frequencies than cars with larger wheelbases.

TABLE 4

INJURY CLAIM FREQUENCIES FOR CARS OF DIFFERENT SIZES[1] – PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

CAR SIZE	CLAIM FREQUENCY PER 1,000 INSURED VEHICLE YEARS
All Combined	18.6
Subcompact[2]	23.6
Compact[3]	19.3
Intermediate[4]	16.5
Full-Size[5]	15.3

[1] Results are standardized to the exposure distribution:
15% Youthful Operator
85% No Youthful Operator
[2] Wheelbase less than or equal to 101 inches.
[3] Wheelbase greater than 101 and less than or equal to 111 inches.
[4] Wheelbase greater than 111 and less than or equal to 120 inches.
[5] Wheelbase greater than 120 inches.

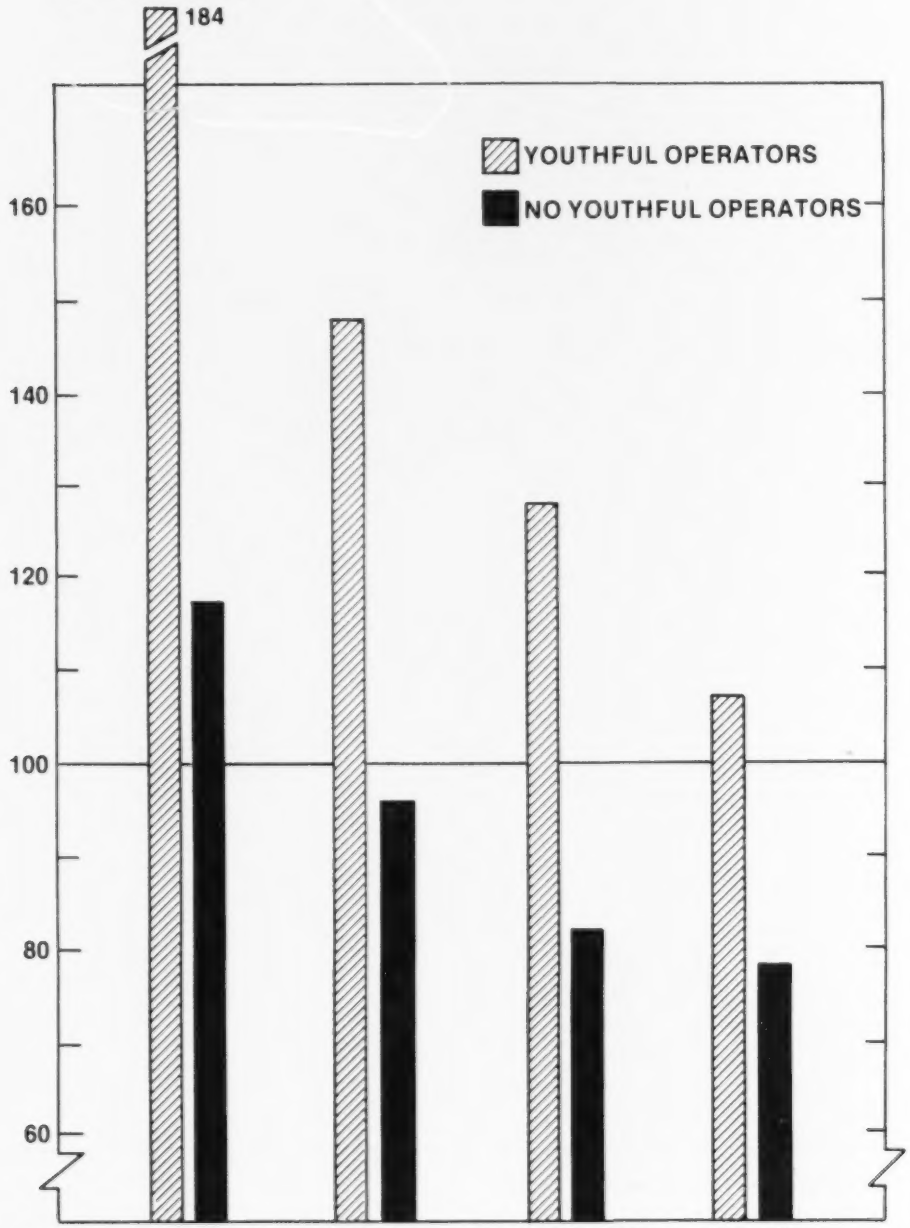
Figure 3 shows the claim frequency results, relative to the all-vehicle-combined result of 18.6 claims per 1,000 insured vehicle years, for youthful and no youthful operators within each of the car size groups. The relationships between injury losses, operator age group, and car size seen in Figure 1 is also seen in Figure 3: in each size group, youthful operators had higher injury claim frequencies than no youthful operators, and the claim frequencies for *both age* groups increased greatly with decreasing wheelbase.

Comparison of Results for Body Style Subgroups

Figure 4 shows the relative injury claim frequencies for the regular two-door, regular four-door, and sports or specialty models within each of the car size groups. There was insufficient exposure for regular four-door models in the subcompact size group to report their results.

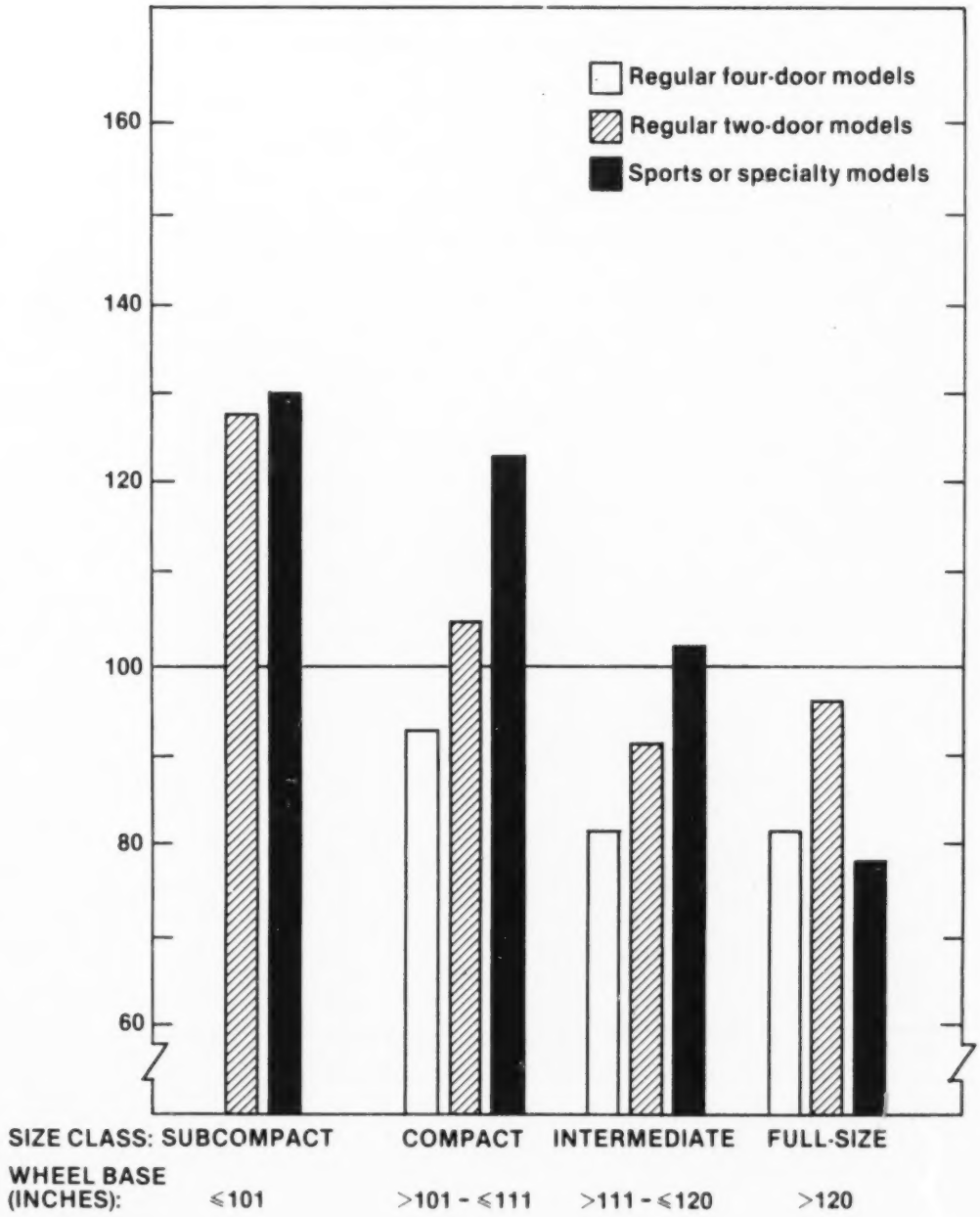
Among subcompacts, compacts, and intermediates, the injury claim frequencies for *each* of the three body style subgroups varied inversely with wheelbase.

Figure 3
Relative injury claim frequencies by operator age group personal injury protection coverages
1977 models



SIZE CLASS:	SUBCOMPACT	COMPACT	INTERMEDIATE	FULL-SIZE
WHEELBASE (INCHES):	≤101	>101 - ≤111	>111 - ≤120	>120
PERCENT OF TOTAL EXPOSURE:	22%	18%	50%	10%

Figure 4
Relative injury claim frequencies by body style personal injury protection coverages 1977 models



Within the compact, intermediate, and full-size groups, the injury claim frequencies were markedly higher for two-door models than the corresponding four-door models. Within the subcompact, compact, and intermediate size groups, injury claim frequencies were highest for sports or specialty models.

Variations Among Individual Series

Table 5 summarizes the individual series with the best and the worst injury loss experience among the 1977 model year cars. Separate results are shown for high-volume cars (those with at least one percent of the total exposure for the model year) and low-volume cars (those with less than one percent of the total exposure). These rankings are based on the relative injury claim frequencies shown in Table 6.

Among the high-volume cars, the Datsun B-210 (146) had the highest relative injury claim frequency and the four-door Oldsmobile Delta 88 (73) had the lowest. Among the low-volume cars, the Datsun 200 SX (183) had the highest relative claim frequency and the four-door Chrysler Newport (59) had the lowest, a three-fold variation.

Of the ten cars listed with the worst injury loss experience, eight were subcompacts, and two were compacts, both specialty models.

Comparing results in Tables 3 and 6 for the 1977 and 1978 model years shows that the Datsun B-210, Honda Civic, and Toyota Corolla were among the worst cars in both model years.

TABLE 5

RELATIVE INJURY CLAIM FREQUENCIES PER 1,000 INSURED VEHICLE YEARS FOR THE 1977 MODEL YEAR CARS WITH THE BEST AND WORST LOSS EXPERIENCE[1] PERSONAL INJURY PROTECTION COVERAGES

	BEST CARS				WORST CARS			
HIGH VOLUME (At least 1% of total exposure)	Oldsmobile Delta 88	4-Door	I	73	Datsun B-210	—[2]	SC	146
	Buick LeSabre	4-Door	I	76	Chevrolet Chevette	2-Door	SC	136
	Chevrolet Caprice	4-Door	I	77	Toyota Corolla	—[2]	SC	135
	Dodge Aspen	S.W.	I	77	Pontiac Firebird	Spec.	C	127
	Cadillac DeVille	2-Door	FS	79	Chevrolet Camaro	Spec.	C	123
	Chevrolet Impala	4-Door	I	79				
LOW VOLUME (Less than 1% of total exposure)	Chrysler Newport	4-Door	FS	59	Datsun 200 SX	2-Door	SC	183
	Oldsmobile 98	4-Door	I	62	Plymouth Arrow	2-Door	SC	161
	Chevrolet Caprice Est.	S.W.	I	63	Chevrolet Vega	2-Door	SC	148
	Buick Skylark	4-Door	C	69	Honda Civic	2-Door	SC	141
	Pontiac Catalina Safari	S.W.	I	69	Datsun 280Z	Sports	SC	134

[1] Results are standardized to the exposure distribution:

YOUTHFUL OPERATOR	NO YOUTHFUL OPERATOR
15%	85%

100 = 18.6 claims per 1000 insured vehicle years
= claim frequency for all 1977 model year cars

[2] Body style not determinable from Vehicle Identification Number.

Subcompact (SC) – cars with wheelbases less than or equal to 101 inches.

Compact (C) – cars with wheelbases greater than 101 inches and less than or equal to 111 inches.

Intermediate (I) – cars with wheelbases greater than 111 inches and less than or equal to 120 inches.

Full-Size (FS) – cars with wheelbases greater than 120 inches.

Of the eleven cars listed with the best injury loss experience, eight were intermediates, two were full-size models, and one was a compact. Seven of the eleven were four-door models, three were station wagons, and only one was a two-door model. All of the eleven best were made by two manufacturers, Chrysler and General Motors.

Comparing results in Tables 3 and 6 shows that the four-door models of the Buick LeSabre, Chevrolet Caprice, Chevrolet Impala, and Oldsmobile Delta 88 were among the best cars in both model years. Previous HLDI results have also shown that the loss experience of specific makes and series remains consistent across model years.*

Table 6 presents the relative injury claim frequency results for the 1977 models by car size group, body style subgroup, and individual series. Detailed results corresponding to those in Table 6 are given in Appendix A.

The results for 89 individual series in Table 6 are listed in ascending sequence of the relative clain frequencies within each body style subgroup.

TABLE 6

RELATIVE INJURY CLAIM FREQUENCY RESULTS BY MAKE AND SERIES*
PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

PART A: ALL CARS

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
All	All	1,684,565	100 = 18.6

See page 23 for footnotes.

Automobile Insurance Losses, Collision Coverages: The Consistency of the Loss Experience of Specific Vehicles Produced in Several Years – 1975 to 1978 Models. Research Report HLDI A-11, June 1979, Highway Loss Data Institute, Washington, D.C.

TABLE 6

RELATIVE INJURY CLAIM FREQUENCY RESULTS BY MAKE AND SERIES*
PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

PART B: SUBCOMPACT CARS (Wheelbase ≤ 101 in.)

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
Regular Two-Door Models		**296,579**	**128**
Pontiac	Sunbird	10,326	97
Honda	Accord	10,574	106
Volkswagen	Rabbit†	28,998	114
Ford	Mustang II	21,454	115
Toyota	Celica	25,013	122
Chevrolet	Monza	12,224	132
American	Gremlin	7,482	132
Ford	Pinto	15,519	133
Toyota	Corolla†	24,966	135
Chevrolet	Chevette	22,817	136
Honda	Civic	16,426	141
Datsun	B-210†	33,299	146
Chevrolet	Vega	7,441	148
Plymouth	Arrow	5,063	161
Datsun	200 SX	5,038	183
Regular Four-Door Models		**	**
Station Wagons		**48,537**	**114**
American	Pacer	6,449	76
Toyota	Corolla	7,008	117
Ford	Pinto	10,755	120
Sports		**22,081**	**130**
Chevrolet	Corvette	7,205	111
Datsun	280Z	7,362	134

See page 23 for footnotes.

TABLE 6

RELATIVE INJURY CLAIM FREQUENCY RESULTS BY MAKE AND SERIES*
PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

PART C: COMPACT CARS (101 in. < wheelbase ≤ 111 in.)

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
Regular Two-Door Models		**132,683**	**105**
Oldsmobile	Omega	5,683	82
Buick	Skylark	11,319	87
Chevrolet	Nova	31,104	97
Plymouth	Volare	14,292	101
Dodge	Aspen	11,805	106
Ford	Granada	32,477	115
Ford	Maverick	6,508	118
Pontiac	Ventura	5,714	122
Mercury	Monarch	8,232	125
Regular Four-Door Models		**102,856**	**93**
Buick	Skylark	8,951	69
Mercury	Monarch	9,530	87
Chevrolet	Nova	27,336	92
Ford	Granada	30,201	96
Oldsmobile	Omega	5,271	96
Ford	Maverick	8,152	103
Station Wagons		**6,436**	**105**
Specialty		**58,662**	**123**
Chevrolet	Camaro	33,003	123
Pontiac	Firebird	22,536	127

See page 23 for footnotes.

TABLE 6

RELATIVE INJURY CLAIM FREQUENCY RESULTS BY MAKE AND SERIES*
PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

PART D: INTERMEDIATE CARS (111 in. < wheelbase ≤ 120 in.)

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
Regular Two-Door Models		**252,493**	**91**
Oldsmobile	Delta 88	11,211	72
Oldsmobile	Ninety Eight	5,613	82
Pontiac	Bonneville	5,179	86
Chevrolet	Caprice	11,661	87
Oldsmobile	Cutlass	81,139	87
Buick	LeSabre	11,052	87
Buick	Century	41,495	92
Chevrolet	Chevelle	25,842	95
Plymouth	Fury	6,210	95
Buick	Electra 225	8,261	97
Pontiac	LeMans	6,530	101
Chevrolet	Impala	9,364	102
Ford	LTD II	12,472	106
Regular Four-Door Models		**251,585**	**81**
Oldsmobile	Ninety Eight	12,868	62
Oldsmobile	Delta 88	21,407	73
Oldsmobile	Cutlass	13,377	74
Buick	LeSabre	19,540	76
Chevrolet	Caprice	32,645	77
Pontiac	Catalina	7,467	77
Chevrolet	Impala	27,395	79
Buick	Electra 225	12,930	82
Buick	Century	9,078	83
Plymouth	Volare	17,567	84
Ford	LTD II	9,077	89
Pontiac	Bonneville	14,033	89
Dodge	Aspen	15,593	89
Chevrolet	Chevelle	16,376	101
Station Wagons		**117,573**	**76**
Chevrolet	Caprice Estate	8,765	63
Pontiac	Catalina Safari	5,126	69
Chevrolet	Impala	9,889	71
Chevrolet	Chevelle	10,993	77
Ford	LTD II	5,595	77
Dodge	Aspen	22,702	77
Oldsmobile	Cutlass	6,184	78
Plymouth	Volare	27,777	83

(Part D Cont'd)

PART D: INTERMEDIATE CARS (Cont'd)

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
Specialty		**223,410**	**102**
Chrysler	Cordoba	26,459	93
Pontiac	Grand Prix	47,482	96
Mercury	Cougar XR-7	18,613	104
Ford	Thunderbird	48,182	106
Chevrolet	Monte Carlo	70,256	108
Dodge	Charger	5,032	111

See page 23 for footnotes.

TABLE 6

RELATIVE INJURY CLAIM FREQUENCY RESULTS BY MAKE AND SERIES*
PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

PART E: FULL-SIZE CARS (wheelbase > 120 in.)

MAKE	SERIES	TOTAL EXPOSURE (INSURED VEHICLE YEARS)	RELATIVE CLAIM FREQUENCY
All	**Full-Size**	**167,079**	**82**
Regular Two-Door Models		**27,901**	**96**
Ford	LTD	16,941	97
Regular Four-Door Models		**56,448**	**81**
Chrysler	Newport	7,681	59
Chrysler	New Yorker	6,074	78
Ford	LTD	25,683	83
Mercury	Marquis	10,697	94
Station Wagons		**16,118**	**77**
Ford	LTD	11,392	77
Specialty		**66,612**	**78**
Cadillac	DeVille 4D	12,602	74
Lincoln	Continental 4D	6,814	75
Cadillac	DeVille 2D	22,083	79
Cadillac	Eldorado	5,687	80
Lincoln	Mark V	9,162	87

Footnotes for Table 6:

*Results are standardized to the exposure distribution:

Youthful Operator	No Youthful Operator
15%	85%

Series are ranked within group and subgroup by ascending claim frequency per 1,000 insured vehicle years. Series with less than 5,000 insured vehicle years of exposure are not summarized.

†Body style is not determinable from Vehicle Identification Number.

**This subgroup has less than 5,000 insured vehicle years of exposure.

Appendix A

Detailed Injury Claim Frequency Results
Personal Injury Protection Coverages
1977 and 1978 Models

TABLE A-1

DETAILED INJURY CLAIM FREQUENCY RESULTS
PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

PART A: ALL CARS

SIZE CLASS, BODY STYLE MAKE & SERIES		YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
		TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
All	All	95,264	3,069	32.2	560,227	10,520	18.8	20.7	20.8	0.3

TABLE A-1

DETAILED INJURY CLAIM FREQUENCY RESULTS
PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

PART B: SUBCOMPACT CARS (wheelbase ≤ 101 in.)

SIZE CLASS, BODY STYLE MAKE & SERIES		YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
		TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
All	**Subcompact**	**43,015**	**1,593**	**37.0**	**149,195**	**3,473**	**23.3**	**26.4**	**25.4**	**0.6**
Regular Two-Door Models		**35,895**	**1,366**	**38.1**	**102,416**	**2,481**	**24.2**	**27.8**	**26.3**	**0.7**
Chevrolet	Chevette	2,707	88	32.5	8,239	162	19.7	22.8	21.6	2.3
Volkswagen	Rabbit*	2,001	57	28.5	12,908	266	20.6	21.7	21.8	2.0
Pontiac	Sunbird	2,066	70	33.9	3,744	76	20.3	25.1	22.3	3.4
Honda	Accord	805	21	26.1	4,936	108	21.9	22.5	22.5	3.3
Chevrolet	Monza	2,969	111	37.4	4,948	99	20.0	26.5	22.6	2.9
Ford	Pinto	2,596	100	38.5	7,050	170	24.1	28.0	26.3	2.8
Toyota	Celica	1,711	59	34.5	5,552	144	25.9	27.9	27.2	3.2
Ford	Mustang II	6,107	218	35.7	10,389	273	26.3	29.8	27.7	2.3
Datsun	B-210*	2,065	93	45.0	5,842	154	26.4	31.2	29.2	3.2
Toyota	Corolla*	3,142	125	39.8	9,279	258	27.8	30.8	29.6	2.6
Honda	Civic	1,752	86	49.1	5,053	134	26.5	32.3	29.9	3.5
Regular Four-Door Models		**4,010**	**125**	**31.2**	**22,938**	**496**	**21.6**	**23.0**	**23.0**	**1.5**
Chevrolet	Chevette	1,866	53	28.4	10,530	225	21.4	22.4	22.4	2.2
Plymouth	Horizon	945	31	32.8	5,554	125	22.5	24.0	24.0	3.2
Station Wagons		**1,834**	**58**	**31.6**	**17,328**	**331**	**19.1**	**20.3**	**21.0**	**1.8**
Sports		**1,276**	**44**	**34.5**	**6,512**	**165**	**25.3**	**26.8**	**26.7**	**3.0**

*Body style is not determinable from Vehicle Identification Number.

TABLE A-1

DETAILED INJURY CLAIM FREQUENCY RESULTS
PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

PART C: COMPACT CARS (101 in. < wheelbase ≤ 111 in.)

SIZE CLASS, BODY STYLE MAKE & SERIES		YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
		TOTAL EXPOSURE	NUMBER OF OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
All	**Compact**	**37,094**	**1,106**	**29.8**	**208,034**	**3,879**	**18.6**	**20.3**	**20.3**	**0.5**
Regular Two-Door Models		**14,662**	**434**	**29.6**	**89,751**	**1,663**	**18.5**	**20.1**	**20.2**	**0.7**
Oldsmobile	Cutlass	3,326	71	21.3	24,168	428	17.7	18.1	18.2	1.3
Chevrolet	Malibu	1,077	32	29.7	6,877	118	17.2	18.9	19.1	2.6
Buick	Century/Regal	1,626	41	25.2	13,729	254	18.5	19.2	19.5	1.9
Chevrolet	Nova	1,774	64	36.1	7,596	134	17.6	21.1	20.4	2.4
Ford	Granada	982	34	34.6	6,136	127	20.7	22.6	22.8	3.0
Ford	Fairmont	1,652	59	35.7	9,658	227	23.5	25.3	25.3	2.5
Regular Four-Door Models		**3,891**	**97**	**24.9**	**46,369**	**756**	**16.3**	**17.0**	**17.6**	**1.0**
Chevrolet	Nova	745	17	22.8	7,258	111	15.3	16.0	16.4	2.4
Chevrolet	Malibu	525	12	22.8	6,772	107	15.8	16.3	16.8	2.7
Ford	Granada	507	19	37.4	6,045	86	14.2	16.0	17.7	3.0
Ford	Fairmont	557	12	21.5	6,224	120	19.3	19.5	19.6	2.9
Station Wagons		**1,364**	**37**	**27.1**	**23,559**	**360**	**15.3**	**15.9**	**17.1**	**1.6**
Chevrolet	Malibu	336	7	20.8	5,665	86	15.2	15.5	16.0	3.0
Ford	Fairmont	477	18	37.7	7,676	122	15.9	17.2	19.2	3.0
Specialty		**17,178**	**538**	**31.3**	**48,355**	**1,100**	**22.7**	**25.0**	**24.0**	**1.0**
Pontiac	Grand Prix	1,676	62	37.0	12,991	268	20.6	22.5	23.1	2.1
Chevrolet	Monte Carlo	2,714	85	31.3	17,649	405	22.9	24.1	24.2	1.8
Chevrolet	Camaro	7,888	244	30.9	9,886	235	23.8	26.9	24.9	2.2
Pontiac	Firebird	4,771	139	29.1	6,811	167	24.5	26.4	25.2	2.7

TABLE A-1

DETAILED INJURY CLAIM FREQUENCY RESULTS
PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

PART D: INTERMEDIATE CARS (111 in. < wheelbase ≤ 120 in.)

SIZE CLASS, BODY STYLE MAKE & SERIES		YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
		TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
All	**Intermediate**	**13,104**	**323**	**24.6**	**155,224**	**2,424**	**15.6**	**16.3**	**16.9**	**0.6**
Regular Two-Door Models		**3,174**	**93**	**29.3**	**32,430**	**531**	**16.4**	**17.5**	**18.3**	**1.2**
Oldsmobile	Delta 88	334	9	27.0	5,277	73	13.8	14.6	15.8	3.2
Ford	LTD II	931	34	36.5	4,462	94	21.1	23.7	23.4	3.4
Regular Four-Door Models		**3,670**	**68**	**18.5**	**63,271**	**882**	**13.9**	**14.2**	**14.6**	**0.9**
Oldsmobile	Delta 88	477	7	14.7	8,687	95	10.9	11.1	11.5	2.1
Chevrolet	Caprice	640	10	15.6	10,174	131	12.9	13.0	13.3	2.0
Buick	LeSabre	331	2	6.0	6,288	94	14.9	14.5	13.6	2.4
Pontiac	Bonneville	265	2	7.5	5,280	82	15.5	15.1	14.3	2.7
Chevrolet	Impala	495	8	16.2	7,957	124	15.6	15.6	15.7	2.4
Station Wagons		**1,268**	**23**	**18.1**	**21,461**	**315**	**14.7**	**14.9**	**15.2**	**1.5**
Specialty		**4,991**	**139**	**27.8**	**38,062**	**696**	**18.3**	**19.4**	**19.7**	**1.1**
Chrysler	Cordoba	528	9	17.1	5,715	98	17.1	17.1	17.1	2.8
Ford	Thunderbird	2,490	73	29.3	19,079	360	18.9	20.1	20.5	1.6
Mercury	Cougar XR-7	1,436	40	27.9	8,535	164	19.2	20.5	20.5	2.4

TABLE A-1

DETAILED INJURY CLAIM FREQUENCY RESULTS
PERSONAL INJURY PROTECTION COVERAGES – 1978 MODELS

PART E: FULL-SIZE CARS (wheelbase > 120 in.)

SIZE CLASS, BODY STYLE MAKE & SERIES	YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
All Full-size	**2,050**	**47**	**22.9**	**47,774**	**744**	**15.6**	**15.9**	**16.7**	**1.1**
Regular Two-Door Models	**373**	**9**	**24.1**	**7,369**	**129**	**17.5**	**17.8**	**18.5**	**2.9**
Regular Four-Door Models	**606**	**8**	**13.2**	**12,879**	**203**	**15.8**	**15.6**	**15.4**	**1.9**
Ford LTD	282	3	10.6	6,069	99	16.3	16.1	15.4	2.7
Station Wagons	**	**	**	**	**	**	**	**	**
Specialty	**863**	**21**	**24.3**	**23,905**	**358**	**15.0**	**15.3**	**16.4**	**1.7**
Cadillac DeVille 2D	264	8	30.3	7,479	109	14.6	15.1	17.0	3.3

**This subgroup has less than 5,000 insured vehicle years of exposure.

TABLE A-2

DETAILED INJURY CLAIM FREQUENCY RESULTS
PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

PART A: ALL CARS

SIZE CLASS, BODY STYLE MAKE & SERIES		YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
		TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
All	All	225,144	6,376	28.3	1,459,421	24,645	16.9	18.4	18.6	0.2

TABLE A-2

DETAILED INJURY CLAIM FREQUENCY RESULTS
PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

PART B: SUBCOMPACT CARS (wheelbase ≤ 101 in.)

SIZE CLASS, BODY STYLE MAKE & SERIES		YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
		TOTAL EXPOSURE	NUMBER OF OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
All	**Subcompact**	**81,204**	**2,776**	**34.2**	**290,586**	**6,312**	**21.7**	**24.4**	**23.6**	**0.4**
Regular Two-Door Models		**72,194**	**2,464**	**34.1**	**224,385**	**4,968**	**22.1**	**25.1**	**23.9**	**0.5**
Pontiac	Sunbird	3,196	86	26.9	7,130	117	16.4	19.7	18.0	2.2
Honda	Accord	1,253	40	31.9	9,320	165	17.7	19.4	19.8	2.3
Volkswagen	Rabbit*	4,225	122	28.9	24,774	490	19.8	21.1	21.2	1.4
Ford	Mustang II	7,266	224	30.8	14,188	281	19.8	23.5	21.4	1.7
Toyota	Celica	7,379	224	30.4	17,634	378	21.4	24.1	22.7	1.6
Chevrolet	Monza	4,245	137	32.3	7,980	184	23.1	26.3	24.5	2.5
American	Gremlin	1,837	72	39.2	5,646	124	22.0	26.2	24.6	3.0
Ford	Pinto	4,222	155	36.7	11,297	255	22.6	26.4	24.7	2.1
Toyota	Corolla*	5,641	179	31.7	19,325	464	24.0	25.8	25.2	1.7
Chevrolet	Chevette	5,254	193	36.7	17,563	409	23.3	26.4	25.3	1.7
Honda	Civic	3,772	165	43.7	12,654	294	23.2	27.9	26.3	2.1
Datsun	B-210*	8,119	325	40.0	25,181	627	24.9	28.6	27.2	1.5
Chevrolet	Vega	2,012	71	35.3	5,430	143	26.3	28.8	27.6	3.2
Plymouth	Arrow	1,716	60	35.0	3,346	97	29.0	31.0	29.9	4.3
Datsun	200 SX	1,288	58	45.0	3,750	120	32.0	35.3	34.0	4.3
Regular Four-Door Models		**	**	**	**	**	**	**	**	**
Station Wagons		**4,733**	**141**	**29.8**	**43,805**	**865**	**19.7**	**20.7**	**21.2**	**1.1**
American	Pacer	528	12	22.7	5,921	75	12.7	13.5	14.2	2.6
Toyota	Corolla	605	21	34.7	6,403	124	19.4	20.7	21.7	3.1
Ford	Pinto	1,331	34	25.5	9,424	205	21.8	22.2	22.4	2.4
Sports		**3,523**	**141**	**40.0**	**18,559**	**397**	**21.4**	**24.4**	**24.2**	**1.7**
Chevrolet	Corvette	813	17	20.9	6,393	131	20.5	20.5	20.6	2.8
Datsun	280Z	1,288	52	40.4	6,074	135	22.2	25.4	24.9	3.0

*Body style is not determinable from Vehicle Identification Number.
**This subgroup has less than 5,000 insured vehicle years of exposure.

TABLE A-2

DETAILED INJURY CLAIM FREQUENCY RESULTS
PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

PART C COMPACT CARS (101 in. < wheelbase ≤ 111 in.)

SIZE CLASS, BODY STYLE MAKE & SERIES		YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
		TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
All	**Compact**	**54,520**	**1,502**	**27.5**	**246,116**	**4,391**	**17.8**	**19.6**	**19.3**	**0.4**
Regular Two-Door Models		**21,622**	**592**	**27.4**	**111,061**	**2,025**	**18.2**	**19.7**	**19.6**	**0.6**
Oldsmobile	Omega	1,024	25	24.4	4,659	64	13.7	15.7	15.3	2.7
Buick	Skylark	1,373	23	16.8	9,946	160	16.1	16.2	16.2	2.0
Chevrolet	Nova	5,826	164	28.2	25,278	413	16.3	18.6	18.1	1.2
Plymouth	Volare	2,831	65	23.0	11,461	207	18.1	19.0	18.8	1.9
Dodge	Aspen	2,186	60	27.5	9,620	176	18.3	20.0	19.7	2.1
Ford	Granada	4,186	135	32.2	28,291	550	19.4	21.1	21.3	1.3
Ford	Maverick	1,129	29	25.7	5,378	115	21.4	22.1	22.0	3.0
Pontiac	Ventura	998	28	28.0	4,716	103	21.8	22.9	22.7	3.3
Mercury	Monarch	1,038	35	33.7	7,194	155	21.5	23.1	23.3	2.8
Regular Four-Door Models		**9,030**	**228**	**25.2**	**93,826**	**1,491**	**15.9**	**16.7**	**17.3**	**0.7**
Buick	Skylark	621	12	19.3	8,330	98	11.8	12.3	12.9	2.2
Mercury	Monarch	733	17	23.2	8,797	130	14.8	15.4	16.1	2.3
Chevrolet	Nova	2,719	71	26.1	24,617	383	15.6	16.6	17.2	1.4
Ford	Granada	2,533	59	23.3	27,669	464	16.8	17.3	17.8	1.3
Oldsmobile	Omega	484	13	26.9	4,787	78	16.3	17.3	17.9	3.2
Ford	Maverick	804	26	32.3	7,349	124	16.9	18.4	19.2	2.6
Station Wagons		**415**	**12**	**28.9**	**6,020**	**107**	**17.8**	**18.5**	**19.5**	**3.2**
Specialty		**23,453**	**670**	**28.6**	**35,209**	**768**	**21.8**	**24.5**	**22.8**	**1.1**
Chevrolet	Camaro	14,447	406	28.1	18,556	407	21.9	24.6	22.8	1.6
Pontiac	Firebird	8,822	262	29.7	13,715	310	22.6	25.4	23.7	1.9

TABLE A-2

DETAILED INJURY CLAIM FREQUENCY RESULTS
PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

PART D. INTERMEDIATE CARS (111 in. < wheelbase ≤ 120 in.)

SIZE CLASS, BODY STYLE MAKE & SERIES		YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
		TOTAL EXPOSURE	NUMBER OF OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
All	**Intermediate**	**81,922**	**1,949**	**23.8**	**763,138**	**11,623**	**15.2**	**16.1**	**16.5**	**0.2**
Regular Two-Door Models		**31,082**	**758**	**24.4**	**221,411**	**3,451**	**15.6**	**16.7**	**16.9**	**0.4**
Oldsmobile	Delta 88	710	11	15.5	10,501	137	13.0	13.2	13.4	1.9
Oldsmobile	Ninety Eight	228	5	21.9	5,385	76	14.1	14.4	15.3	3.3
Pontiac	Bonneville	295	7	23.7	4,884	72	14.7	15.3	16.0	3.3
Chevrolet	Caprice	817	15	18.4	10,844	170	15.7	15.9	16.1	2.0
Oldsmobile	Cutlass	12,730	276	21.7	68,408	1,032	15.1	16.1	16.1	0.7
Buick	LeSabre	593	20	33.7	10,458	137	13.1	14.2	16.2	2.4
Buick	Century	5,104	134	26.3	36,391	565	15.5	16.8	17.1	1.1
Chevrolet	Chevelle	4,309	126	29.2	21,532	338	15.7	18.0	17.7	1.4
Plymouth	Fury	844	21	24.9	5,366	88	16.4	17.6	17.7	2.8
Buick	Electra 225	377	9	23.9	7,884	135	17.1	17.4	18.1	2.8
Pontiac	LeMans	1,011	20	19.8	5,519	102	18.5	18.7	18.7	2.8
Chevrolet	Impala	663	16	24.1	8,701	157	18.0	18.5	18.9	2.5
Ford	LTD II	1,649	47	28.5	10,824	197	18.2	19.6	19.7	2.1
Regular Four-Door Models		**15,469**	**344**	**22.2**	**236,117**	**3,227**	**13.7**	**14.2**	**15.0**	**0.4**
Oldsmobile	Ninety Eight	645	12	18.6	12,223	127	10.4	10.8	11.6	1.8
Oldsmobile	Delta 88	1,239	24	19.4	20,168	252	12.5	12.9	13.5	1.5
Oldsmobile	Cutlass	809	16	19.8	12,568	160	12.7	13.2	13.8	1.9
Buick	LeSabre	1,000	20	20.0	18,540	242	13.1	13.4	14.1	1.6
Chevrolet	Caprice	1,955	42	21.5	30,690	399	13.0	13.5	14.3	1.2
Pontiac	Catalina	441	6	13.6	7,026	102	14.5	14.5	14.4	2.4
Chevrolet	Impala	1,745	35	20.1	25,650	351	13.7	14.1	14.7	1.3
Buick	Electra 225	598	15	25.1	12,333	165	13.4	13.9	15.2	2.2
Buick	Century	466	16	34.3	8,611	104	12.1	13.2	15.4	2.7
Plymouth	Volare	1,351	31	22.9	16,216	233	14.4	15.0	15.7	1.7
Ford	LTD II	605	17	28.1	8,472	123	14.5	15.4	16.5	2.5
Pontiac	Bonneville	783	15	19.2	13,250	212	16.0	16.2	16.5	2.0
Dodge	Aspen	1,110	28	25.2	14,483	217	15.0	15.7	16.5	1.8
Chevrolet	Chevelle	1,325	37	27.9	15,051	258	17.1	18.0	18.7	1.9

PART D: INTERMEDIATE CARS (Cont'd)

SIZE CLASS, BODY STYLE MAKE & SERIES		YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
		TOTAL EXPOSURE	NUMBER OF OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
Station Wagons		**7,090**	**138**	**19.5**	**110,483**	**1,454**	**13.2**	**13.5**	**14.1**	**0.6**
Chevrolet	Caprice Estate	500	4	8.0	8,266	102	12.3	12.1	11.7	2.0
Pontiac	Catalina Safari	313	4	12.8	4,813	62	12.9	12.9	12.9	2.8
Chevrolet	Impala	618	13	21.0	9,271	109	11.8	12.3	13.2	2.1
Chevrolet	Chevelle	631	13	20.6	10,362	137	13.2	13.6	14.3	2.1
Ford	LTD II	331	7	21.2	5,265	69	13.1	13.6	14.3	3.0
Dodge	Aspen	1,437	32	22.3	21,264	275	12.9	13.5	14.3	1.5
Oldsmobile	Cutlass	299	7	23.4	5,885	76	12.9	13.4	14.5	3.0
Plymouth	Volare	1,770	34	19.2	26,007	384	14.8	15.0	15.5	1.3
Specialty		**28,281**	**709**	**25.1**	**195,128**	**3,491**	**17.9**	**18.8**	**19.0**	**0.5**
Chrysler	Cordoba	2,286	48	21.0	24,173	401	16.6	17.0	17.3	1.4
Pontiac	Grand Prix	6,742	146	21.7	40,740	696	17.1	17.7	17.8	1.0
Mercury	Cougar XR-7	2,348	61	26.0	16,264	294	18.1	19.1	19.3	1.7
Ford	Thunderbird	4,561	110	24.1	43,621	828	19.0	19.5	19.8	1.1
Chevrolet	Monte Carlo	11,185	317	28.3	59,070	1,107	18.7	20.3	20.1	0.9
Dodge	Charger	843	24	28.5	4,189	81	19.3	20.9	20.7	3.3

TABLE A-2

DETAILED INJURY CLAIM FREQUENCY RESULTS
PERSONAL INJURY PROTECTION COVERAGES – 1977 MODELS

PART E: FULL-SIZE CARS (wheelbase > 120 in.)

SIZE CLASS, BODY STYLE MAKE & SERIES		YOUTHFUL OPERATOR			NO YOUTHFUL OPERATOR			COMBINED CLAIM FREQUENCY	STANDARDIZED CLAIM FREQUENCY	90% CONFIDENCE LIMIT ON STANDARDIZED CLAIM FREQUENCY
		TOTAL EXPOSURE	NUMBER OF OF CLAIMS	CLAIM FREQUENCY	TOTAL EXPOSURE	NUMBER OF CLAIMS	CLAIM FREQUENCY			
All	**Full-Size**	**7,498**	**149**	**19.9**	**159,581**	**2,319**	**14.5**	**14.8**	**15.3**	**0.6**
Regular Two-Door Models		**1,401**	**40**	**28.5**	**26,500**	**422**	**15.9**	**16.6**	**17.8**	**1.6**
Ford	LTD	910	28	30.8	16,032	252	15.7	16.5	18.0	2.0
Regular Four-Door Models		**2,805**	**56**	**20.0**	**53,643**	**764**	**14.2**	**14.5**	**15.1**	**1.0**
Chrysler	Newport	343	3	8.7	7,338	84	11.4	11.3	11.0	2.1
Chrysler	New Yorker	265	4	15.1	5,809	84	14.5	14.5	14.6	2.9
Ford	LTD	1,354	28	20.7	24,329	353	14.5	14.8	15.4	1.4
Mercury	Marquis	501	12	23.9	10,195	165	16.2	16.5	17.4	2.5
Station Wagons		**999**	**14**	**14.0**	**15,119**	**217**	**14.4**	**14.3**	**14.3**	**1.6**
Ford	LTD	676	10	14.8	10,716	152	14.2	14.2	14.3	2.0
Specialty		**2,293**	**39**	**17.0**	**64,319**	**916**	**14.2**	**14.3**	**14.6**	**0.9**
Cadillac	DeVille 4D	458	7	15.3	12,144	163	13.4	13.5	13.7	2.0
Lincoln	Continental 4D	247	3	12.1	6,567	93	14.2	14.1	13.9	2.7
Cadillac	DeVille 2D	670	9	13.4	21,414	320	14.9	14.9	14.7	1.6
Cadillac	Eldorado	190	4	21.0	5,496	76	13.8	14.1	14.9	3.4
Lincoln	Mark V	289	8	27.7	8,873	126	14.2	14.6	16.2	3.0

Appendix B

Specifications of Injury Coverages

Specifications of Injury Coverages

Personal Injury Protection (PIP) Coverages

Personal injury protection coverages provide first-party insurance against medical and other types of losses in "no-fault" states.

The personal injury protection coverages reported in this study were based on data from the 20 states listed in Table B-1.

TABLE B-1
PERSONAL INJURY PROTECTION (PIP) COVERAGES
STATES INCLUDED

Colorado	Minnesota
Connecticut	Nevada
Delaware	New Jersey
Florida	New York
Georgia	North Dakota
Hawaii	Oregon
Kansas	Pennsylvania
Kentucky	South Carolina
Maryland	Texas
Michigan	Utah

Appendix C

Sources and Nature of Data

Sources and Nature of Data

This report is based on both policy and claim-related injury coverages data for 1977 model year cars in the calendar period September 1976 through December 1978 and for 1978 model cars in the calendar period September 1977 through December 1978. These data were supplied by four insurers: Aetna Life & Casualty, Allstate, Nationwide, and State Farm. "Assigned risk" and fleet policies were excluded.

Insurance Policy Data

Insurance policy data, as distinct from claim data, specify the type of medical coverage and describe the characteristics of the insured vehicle, including its make and series. Policy data used in this report included the following basic information:

- Type of Medical Coverage*
- Vehicle Identification Number (VIN)*
- Rated Driver Characteristics*
- Date and Nature of Relevant Changes in Coverage

Insurance Claim Data

Insurance claim data report the characteristics of the insured vehicle, the initiation of the medical coverage claim and/or the corresponding payment. Claim data used in this report included the following basic information:

- Vehicle Identification Number (VIN)
- Crash Date

*See Appendix D for definitions.

Appendix D

Definitions

Definitions

Claim Frequency – The number of claims for a group of vehicles, divided by the exposure for that group; expressed as claims per one thousand insured vehicle years.

Exposure – The time interval an individual vehicle is insured. Exposure for a group of vehicles is expressed in units of insured vehicle years.

First-Party Coverage – An insurance coverage under which the policyholder collects compensation for his losses from his own insurer regardless of fault.

No-Fault Auto Insurance – An auto insurance plan in which each driver/owner accepts financial responsibility for some or all losses sustained by himself, pedestrians hit by him, and occupants of his own vehicle in return for which he enjoys some immunity from liability for losses to third-party persons.

Operator Age Group – The factor distinguishing between those vehicles whose rated driver is youthful and those vehicles whose rated driver is not youthful (see ***Youthful Operator***).

Personal Injury Protection (PIP) Coverage – First-party no-fault coverage in which an insurer pays, within the specified limits, the medical, hospital, and other expenses of the insured, others in his vehicle, and pedestrians struck by him.

Rated Driver – The driver who, for insurance purposes, is considered to represent the greatest loss potential for the insured automobile.

Vehicle Identification Number (VIN) – A code, variously comprising both numbers and letters; normally of between 8 and 15 characters in length, assigned to each automobile by its manufacturer. The VIN uniquely identifies the vehicle within at least a ten-year time span, and in recent model year vehicles, almost always contains coding which identifies the make, series, model year and other characteristics of each vehicle.

Vehicle Series – A name denoting a family of cars, within a make, with the same wheelbase and a degree of commonality in construction such as body, chassis, etc.

Vehicle Size Group – A grouping of vehicles based on wheelbase. There are four car size groups defined as follows:

> ***Subcompact*** – Cars with wheelbases less than or equal to 101 inches.
>
> ***Compact*** – Cars with wheelbases greater than 101 inches and less than or equal to 111 inches.
>
> ***Intermediate*** – Cars with wheelbases greater than 111 inches and less than or equal to 120 inches.
>
> ***Full-Size*** – Cars with wheelbases greater than 120 inches.

Each vehicle size group is further divided into four subgroups – regular two-door models, regular four-door models, station wagons, and sports or specialty models. In the compact, intermediate, and full-size groups, the specialty models are those that either have *only* two-door models or are luxury cars. The sports subgroup in the subcompacts is sports models which are basically two-seater cars.

Youthful Operator – For the purposes of this report, all males (married or single) under 25 years of age and all unmarried females under 25 years of age.

Appendix E

Confidence Intervals for Standardized Claim Frequency

Confidence Intervals for Standardized Claim Frequency

The standardized claim frequency per 1,000 insured vehicle years is given by the equation

$$f = 1{,}000\left[(0.15)\frac{N_1}{T_1} + (0.85)\frac{N_1}{T_2}\right].$$

where N_1 = total claims for the youthful operator age group

N_2 = total claims for the no youthful operator age group

T_1 = exposure in insured vehicle years for the youthful operator age group

T_2 = exposure in insured vehicle years for the no youthful operator age group.

For each operator age group, the distribution of the number of claims N_i can be satisfactorily approximated as a Poisson distribution* with mean and variance $(\lambda_i T_i)$, where

λ_i = claim frequency (per insured vehicle year) for the operator age group

$= N_i/T_i$.

The variance of f is then

$$\sigma^2 = (1{,}000)^2\left[(0.15)^2\frac{\lambda_1}{T_1} + (0.85)^2\frac{\lambda_1}{T_2}\right].$$

For the exposure threshold used in this report, the distribution of the standardized claim frequency can be satisfactorily approximated by a normal distribution with mean f and variance σ^2. A two-sided 90 percent confidence interval for the standardized claim frequency is then given by the expression

$$f \pm 1.645\sigma$$

Example

For personal injury protection coverages, the results for the 1978 Oldsmobile Cutlass two-door models were as follows:

	EXPOSURE IN INSURED VEHICLE YEARS	CLAIM FREQUENCY PER 1,000 INSURED VEHICLE YEARS
Youthful Operator Group	3,326	21.3
No Youthful Operator Group	24,168	17.7

Thus, the standardized claim frequency is:

$$f = (0.15)(21.3) + (0.85)(17.7) = 18.2$$

*Seal, H.L., *Stochastic Theory of a Risk Business*, Wiley, New York (1969).

and the standard deviation is:

$$\sigma = 1{,}000 \sqrt{(0.15)^2 \frac{(0.0213)}{(3{,}326)} + (0.85)^2 \frac{(0.0177)}{(24{,}168)}} = 0.821$$

The 90% confidence interval is then given by:

$$18.2 \pm (1.645)\,(0.821)$$

or

$$18.2 \pm 1.3$$

List of Publications

Other research reports published by the Highway Loss Data Institute are:

R-72-1 *Automobile Insurance Losses, Collision Coverages; Variations by Make and Series, 1972 Models,* June 1973.

R73-1 *Automobile Insurance Losses, Collision Coverages; Initial Results for 1973 Models Compared with 1972 Models,* September 1973.

R73-2 *Automobile Insurance Losses, Collision Coverages; Variations by Make and Series, 1973 Models,* March 1974.

R73-3 *Automobile Insurance Losses, Collision Coverages; Variations by Make and Series, 1973 Models During Their First Two Years,* December 1974.

R73-4 *Automobile Insurance Losses, Collision Coverages; Variations by Make and Series, 1973 Models During Their First Three Years,* December 1975.

R74-1 *Automobile Insurance Losses, Collision Coverages; Initial Results for 1974 Models,* May 1974.

R74-2 *Automobile Insurance Losses, Collision Coverages; Variations by Make and Series, 1974 Models During Their First Year,* December 1974.

R74-3 *Automobile Insurance Losses, Collision Coverages; Variations by Make and Series, 1974 Models During Their First Two Years,* December 1975.

R75-1 *Automobile Insurance Losses, Collision Coverages; Initial Results for 1975 Models,* July 1975.

R75-2 *Automobile Insurance Losses, Collision Coverages; Variations by Make and Series, 1975 Models During Their First Year,* December 1975.

R76-1 *Automobile Insurance Losses, Collision Coverages; Initial Results for 1976 Models,* June 1976.

R76-2 *Automobile Insurance Losses, Collision Coverages; Variations by Make and Series, 1976 Models During Their First Year, 1975 Models During Their First Two Years, 1974 Models During Their First Three Years,* December 1976.

R77-1 *Automobile Insurance Losses, Collision Coverages; Initial Results for 1977 Models,* June 1977.

R77-2 *Automobile Insurance Losses, Collision Coverages; Variations by Make and Series, 1977 Models During Their First Year, 1976 Models During Their First Two Years, 1975 Models During Their First Three Years,* December 1977.

R78-1 *Automobile Insurance Losses, Collision Coverages; Initial Results for 1978 Models,* June 1978.

R78-2 *Automobile Insurance Losses, Collision Coverages; Variations by Make and Series, 1978 Models During Their First Year, 1977 Models During Their First Two Years, 1976 Models During Their First Three Years,* January 1979.

R79-1 *Automobile Insurance Losses, Collision Coverages; Initial Results for 1979 Models,* June 1979.

V78-1 *Automobile Insurance Losses, Non-Commercial Collision Coverages; Variations by Make and Series, Vans, Pickups, and Utility Vehicles, 1978 Models During Their First Year, 1977 Models During Their First Two Years*, February 1979.

I 75-1 *Automobile Insurance Losses, Injury Coverages; Claim Frequency Results for 1974 and 1975 Models*, June 1976.

I 75-2 *Automobile Insurance Losses, Percentage of Collision Claims with Associated Injury Claims for 1974 and 1975 Models*, March 1977.

I 76-1 *Automobile Insurance Losses, Injury Coverages; Claim Frequency Results for 1974, 1975, and 1976 Models*, November 1977.

I 76-2 *Automobile Insurance Losses, Injury Coverages; Claim Frequency Results for 1974, 1975, and 1976 Models*, September 1978.

I 77-1 *Automobile Insurance Losses, Injury Coverages; Claim Frequency Results for 1977 Models*, September 1978.

A-1 *Automobile Insurance Losses, Collision Coverages; A Comparison of Results for 1972 and 1973 Models*, May 1974.

A-2 *Automobile Insurance Losses, Collision Coverages; Relationships Between Losses and Vehicle Density, 1972 and 1973 Models*, September 1974.

A-3 *Automobile Insurance Losses, Collision Coverages; A Comparison of Results for 1973, 1974 and 1975 Models*, July 1975.

A-4 *Automobile Insurance Losses, Collision Coverages; Relationships Between Losses and Vehicle Density, 1974 and 1975 Models*, December 1975.

A-5 *Automobile Insurance Losses, Collision Coverages; Relationships Between Losses and Vehicle Body Style, 1974 and 1975 Models*, December 1975.

A-6 *Automobile Insurance Losses, Collision Coverages; An Investigation of Relationships Between Losses and Engine Specifications, Using 1973 Models*, June 1976.

A-7 *Automobile Insurance Losses, Collision Coverages; Annual Increases and Seasonal Variations, 1972, 1973, 1974 and 1975 Models*, June 1976.

A-8 *Automobile Insurance Losses, Injury Coverages; A Preliminary Comparison of Results from Volkswagen Rabbits with Passive and Active Seat Belts, 1975 and 1976 Models*, June 1977.

A-9 *Automobile Insurance Losses, Collision Coverages; A Comparison of Collision Claim Size Distributions for 1974, 1975, and 1976 Models*, November 1977.

A-10 *Automobile Insurance Losses, Injury Coverages; Comparisons of the Injury Insurance Claim Experience of Volkswagen Rabbits with Automatic and Manual Seat Belts,* June 1979.

A-11 *Automobile Insurance Losses, Collision Coverages; A Comparison of Results for 1973 Through 1978 Models,* June 1979.